

ABSTRACT OF THE DISCLOSURE

Provided is a wavelength converter utilizing gain non-linearity of a semiconductor optical amplifier for suppressing the degradation of extinction ratio when an inputted signal light undergoes wavelength conversion. In the wavelength converter, a first semiconductor laser outputs an optical signal with a first wavelength to be obtained when the inputted signal light undergoes the wavelength conversion, and a second semiconductor laser outputs an optical signal with a second wavelength which is in opposite phase relation to the optical signal from the first semiconductor laser, thereby producing a Mach-Zehnder interferometer. This Mach-Zehnder interferometer enables a high level of the optical signal with the second wavelength in the opposite phase relation to cancel a low level of the optical signal with the first wavelength after passing through a semiconductor optical amplifier, thus improving the extinction ratio.